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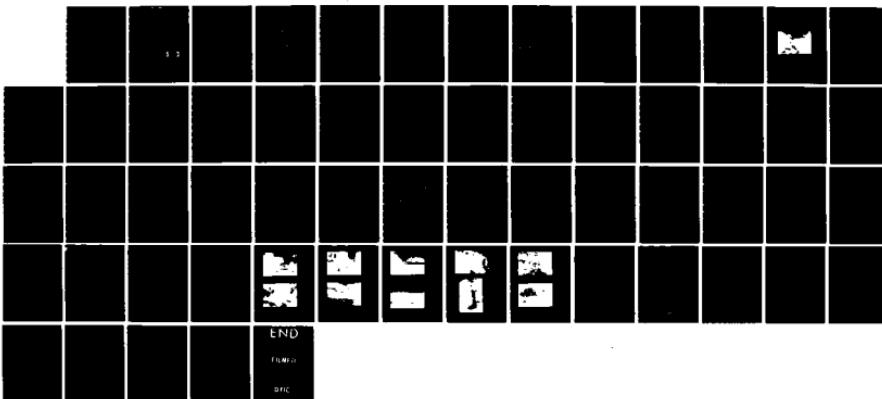
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
MILL POND DAM (MA 805.) (U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV NOV 78

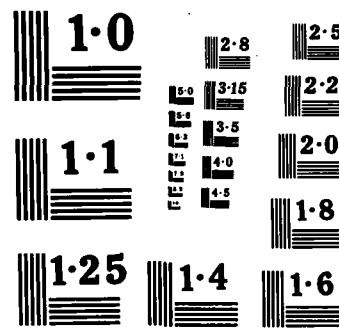
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AD-A156 231

CONNECTICUT RIVER BASIN
SPRINGFIELD, MASSACHUSETTS

MILL POND DAM
MA 00575

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

NOVEMBER 1978

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Connecticut River Basin Springfield, Massachusetts South Branch Mill River		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The dam is about 48 ft. long and 13 ft. high. It is constructed of cut stone masonry. The dam is generally in poor condition. The right end of the dam has had a partial failure at the crest. The dam is classified as small in size with a hazard potential of low. Recommendations for remedial work include repair of the failed area at the right end of the crest of the dam, the plugging of pressure leaks in the dam and mortaring of open joints, and the repair of erosion damage at the right abutment.		

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:

NEDED

JAN 22 1979

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts 02133

Dear Governor King:

I am forwarding to you a copy of the Mill Pond Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Quality Engineering, the cooperating agency for the Commonwealth of Massachusetts. In addition, a copy of the report has also been furnished the owner, City of Springfield, 36 Court Street, Springfield, Massachusetts 01103.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Quality Engineering for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

MILL POND DAM
MA 00575

CONNECTICUT RIVER BASIN
SPRINGFIELD, MASSACHUSETTS

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

Identification No.: MA 00575
Name of Dam: MILL POND
Town: CITY OF SPRINGFIELD
County and State: HAMPDEN COUNTY, MA
Stream: SOUTH BRANCH MILL RIVER
Date of Inspection: 7 September 1978

BRIEF ASSESSMENT

Mill Pond Dam is approximately 48 ft long and approximately 13 ft high. The dam is constructed of cut stone masonry. The full length of the masonry dam is available for spillway capacity. The exact age of the dam is unknown.

The dam is generally in poor condition. The right end of the dam has had a partial failure at the crest. This failure occurred prior to a February 1974 inspection. No evidence was observed during the 1978 site examination that the repairs have been attempted on this failure. In addition, a number of pressure leaks were observed at approximately two-thirds the height of the dam. The repairs to the dam should be accomplished within one year of receipt of the report by the Owner.

Based on Corps of Engineers Guidelines, this dam is classified as a small dam with a low hazard potential which results in a test flood equal to the 100-year flood. Hydraulic analysis indicates that the overflow crest of the dam can pass the test flood at a depth of about 2.5 feet over the top of the masonry dam.

Recommendations for remedial work include repair of the failed area at the right end of the crest of the dam, the plugging of pressure leaks in the dam and mortaring of open joints, and the repair of erosion damage at the right dam abutment. Additional investigations of the dam are recommended since no material data are available concerning the geometry of the structure, the reservoir is not operational and seepage is present in the channel walls.

CAMP DRESSER & MCKEE INC.

Roger H. Wood

Roger H. Wood
Vice President



This Phase I Inspection Report on Mill Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Joseph W. Finegan

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Joseph A. McElroy

JOSEPH A. MCELROY, CHAIRMAN
Chief, NED Materials Testing Lab.
Foundations & Materials Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. PRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I Investigations are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the test flood is based on the estimated "probable maximum flood" for the region (greatest reasonably possible storm runoff), or a fraction thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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Appendix A - Inspection Team Organization and Check List

Appendix B - List of Available Documents and Prior Inspection Reports

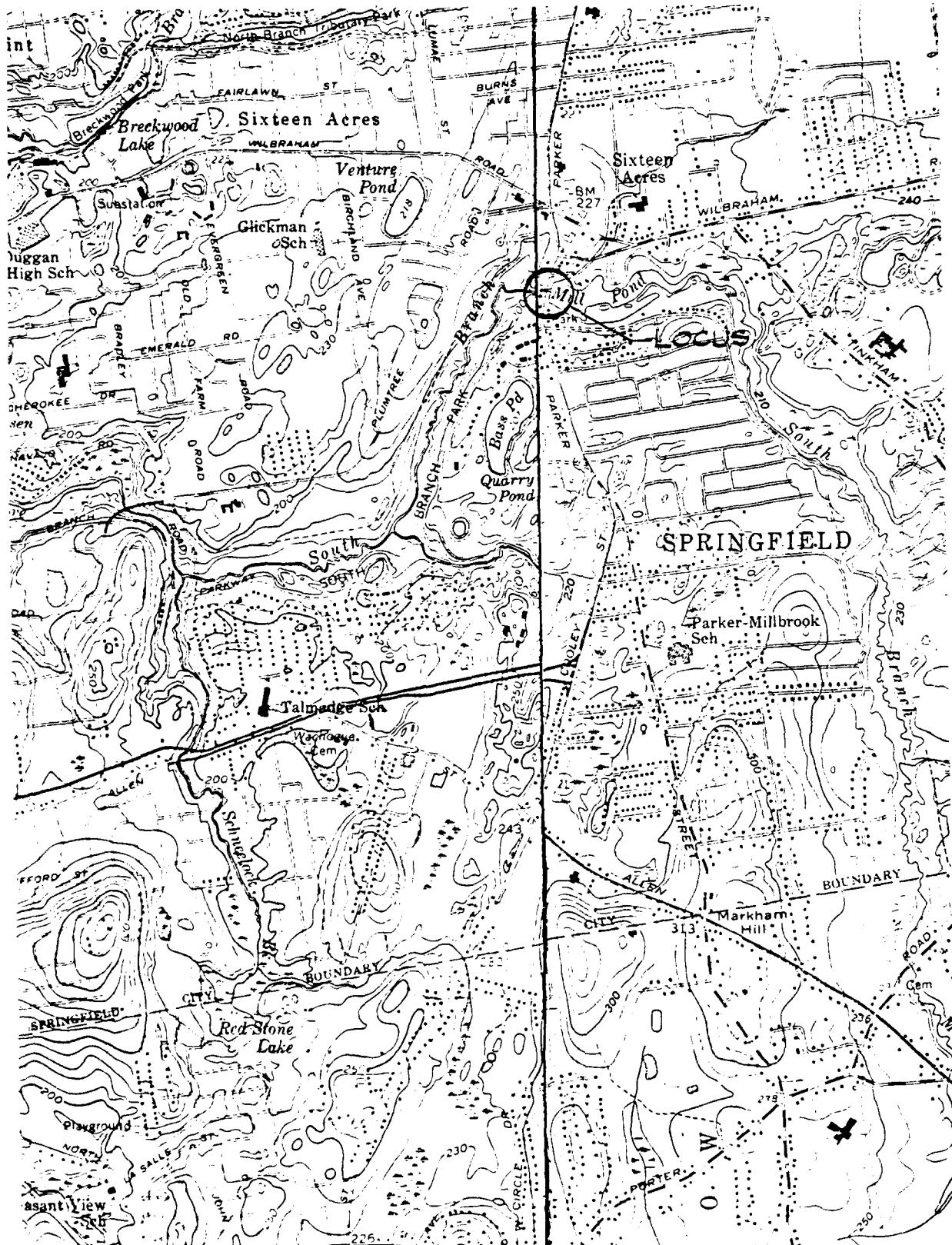
Appendix C - Selected Photographs of Project

Appendix D - Outline of Drainage Area and Hydraulic Computations

Appendix E - Information as Contained in the National Inventory of Dams



1. OVERVIEW OF DAM FROM DOWNSTREAM.



DAM: MILL POND

IDENTIFICATION NO.: MA 00575



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LOCATION MAP
USGS QUADRANGLE
HAMPDEN SPRINGFIELD SOUTH
MA.
SCALE: 1" - 2000'

3 Remedial Measures

a. Operation and Maintenance Procedures - It is recommended that the following remedial work be undertaken by the City of Springfield:

1. Repeat the failed area at the right end of the dam crest.
2. Remove the debris from downstream of the partial failure.
3. Plug the pressure leaks within the dam and fill all open joints in the masonry with mortar.
4. Repair erosion damage at dam right abutment, and provide erosion protection as necessary.
5. Clear overhanging brush and tree branches at least once a year to permit observation of abutment areas.
6. Replace missing and/or fallen stones in the downstream field stone retaining walls.

Due to the condition of this dam, surveillance of the dam should be provided by the owner during and following periods of unusually high precipitation. The owner should also develop a formal emergency procedure plan and warning system. Finally, it is recommended that the owner establish a formal program of annual technical inspections.

SECTION 7: ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

- a. Condition - The visual examination of the Mill Pond Dam revealed that the masonry dam is generally in poor condition. A partial failure of the right end of the crest has occurred. A number of pressure leaks are present at approximately the one-third depth of the dam.

Based on the results of the computations included in Appendix D, the dam is capable of passing the test flood. The recommended test flood is the 100 year flood.

- b. Adequacy of Information - The data available concerning the design and construction of the dam is inadequate for an analysis of the dam. However, the presence of the partial failure of the right hand end of the crest and the pressure leaks in the dam indicate that the structure is in poor condition and could not withstand abnormal loadings such as seismic loadings.
- c. Urgency - It is recommended that remedial work outlined in Section 7.3 be undertaken within one year of the receipt of this report by the Owner.
- d. Need for Additional Investigation - Additional investigations should be performed by the owner to determine the geometry and structural components of the dam and as outlined in the following section.

7.2 Recommendations - It is recommended that the City of Springfield engage a registered professional engineer to undertake the following investigations:

1. An investigation to determine the geometry of the dam and the structural components. A structural stability analysis should be performed based on the results of the investigation.
2. An investigation to determine the work required to make the reservoir drain operable.
3. An investigation to evaluate the seepage that is occurring through the channel walls below the dam abutments. The investigation should include a comparison of the location, character and amount of seepage flow at times of high and low pond levels in an effort to determine the paths of seepage.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Spillway Structural Stability

- a. Visual Observations - No visual evidence of instability in the masonry dam as a whole was noted during the site examination on 7 September 1978. However, individual stones within the dam itself, especially at the right end of the dam crest have experienced lateral motion. It is estimated that the instability of this dam lies with the component parts rather than the dam as a whole. Further movement of the stones, in our opinion, will result in a "crumbling" of the dam.
- b. Design and Construction Data - There are no known data on the design and construction of this dam. The analysis of the dam for structural stability therefore, must be predicated on the visual observations. It is concluded that the stonework of the dam has become loose and eventual failure could be caused by the further displacement of the individual stones.
- c. Operating Records - No operating records are known to exist for the spillway.
- d. Post Construction Changes - No post construction changes are known for this dam. The dam was originally constructed as a grist mill dam. No evidence of a connection to or incorporation within a grist mill was observed during the site examination. It is, therefore, concluded that some post construction changes have been made. The presence of a metal operating platform for the reservoir drain in conjunction with an open joint masonry dam further indicates that post construction changes have been made to the dam.
- e. Seismic Stability - The dam is located in a Seismic Zone No. 2 and in accordance with recommended Phase I guidelines does not warrant seismic analysis.

above Parker Street is 211.7. Since the top of curb elevation at the Parker Street culvert is 213.6, the roadway above the culvert will not be overtopped during the test flood.

- e. Evaluation - Dam failure analysis based on a 40 percent breach of the masonry dam resulted in a peak failure outflow of 1,570 cfs. The first 700 feet of the South Branch Mill River downstream of the dam site has a steep slope of 0.04 and is in a deep gorge with adequate capacity to pass the estimated failure outflow. The remaining portion of the South Branch Mill River has a flat slope of 0.001 to the Plumtree Road Bridge where it enters Watershops Pond. This bridge, assuming that it would not fail, would constrict the failure outflow and create a back-water pool to approximately elevation 178.6. The top of Plumtree Road is at elevation 184.5. A visual inspection of the area and a review of the USGS quad sheets indicates that there are no structures below elevation 180.0 and that damages would only be to roads and utilities. The outflow to Watershops Pond would not create any hazard to the developed area surrounding the Pond.

In conclusion, the dam can pass the test flood with an estimated 2.5 foot depth of flow over the crest and in the event of a dam failure, the potential hazard is considered low.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

- a. Design Data - No hydraulic/hydrologic design data is available concerning this dam.

Based upon the Corps of Engineers guidelines, the recommended test flood for the size (small) and hazard potential (low) is within the range of the 50-year to 100-year recurrence interval.

- b. Experience Data - A preliminary Flood Insurance Study (FIS) for the City of Springfield was completed by Camp Dresser & McKee Inc. under contract with the Department of Housing and Urban Development/Flood Insurance Administration (HUD/FIA) in October, 1978. Floods having a recurrence interval of 10, 50, 100 and 500 years were determined using regional frequency analysis developed by C. G. Johnson and G. D. Tasker of the USGS Water Resources Division. The results of this comprehensive Mill River Watershed analysis compare favorably with the recorded peak discharge at the dam on Watershops Pond for the August, 1955 flood. The 50 and 100-year inflows to Mill Pond were determined to be 740 and 870 cfs respectively. It was found that the pond elevation was controlled by the Parker Street culvert rather than the dam. The following table summarizes the results of the hydrologic analysis.

<u>RECURRENCE INTERVAL</u>	<u>INFLOW (cfs)</u>	<u>POND EL. ABOVE PARKER ST.</u>	<u>OUTFLOW AT DAM (cfs)</u>	<u>DISCHARGE ELEV. AT DAM CREST</u>
50-yr.	740	210.8	590	208.7
100-yr.	870	211.7	670	208.9

Since the discharge elevations of both the 50 and 100-year floods are nearly the same, the 100-year flood was adopted as the test flood.

- c. Visual Observations - At the time of inspection, a considerable amount of debris was present both on the upstream crest of the dam and at the toe. A 6'-6" portion of the right side of the crest has collapsed causing most of the normal flow to discharge at this point. A large amount of debris has collected on the downstream face of the dam beneath the collapsed portion of the crest. The debris consists of large boulders, portions of trees and branches, and a shopping cart.
- d. Overtopping Potential - Since the entire dam crest serves as a spillway, overtopping is not a consideration. The discharge depth for the test flood (670 cfs) is 2.5 feet which results in a discharge elevation of 208.9. The test flood pool elevation

SECTION 4: OPERATIONAL PROCEDURES

- 4.1 Procedures - In general there is no established routine for the operation of the dam.
- 4.2 Maintenance of Dam - There is no established formal maintenance programs for this dam.
- 4.3 Maintenance of Operating Facilities - The gate at this dam receives minimal maintenance. It was found to be inoperative during the site examination.
- 4.4 Description of any Warning System in Effect - There is no established warning system or emergency preparedness plan in effect for this structure.
- 4.5 Evaluation - For a structure of this type and condition, a periodic observation and maintenance program should be established to examine the dam, control tree and brush growth and maintain slopes, walls, and channels. A warning system or emergency preparedness plan should be established. This structure should be observed during periods of high flow and/or unusually high rainfall.

face of the right end of the dam. The platform is at the crest elevation of the spillway and would be inaccessible during periods of high flow. The valve operator was found to be inoperative during the site examination.

The field stone retaining walls on the left side of the downstream channel, Photo Nos. 4 and 10, have some stones missing from the face.

- d. Reservoir Area - The area surrounding Mill Pond is moderately wooded and sparsely developed as shown in Photo No. 7 with about 6 house lots on the northern shoreline. The side slopes to the pond are quite flat upstream of Parker Street and present no significant potential for landslides into the pond. Immediately upstream of the dam, Parker Street crosses the reservoir, constricting the flow to the dam as shown in Photo No. 5 and 6. No conditions were noted that could result in a sudden increase of sediment load into the pond.
 - e. Downstream Channel - The South Branch Mill River is quite steep immediately downstream of the dam site (Slope = 0.04) as shown in Photo No. 3 and is located within a deep gorge having side-walls approximately 15 to 20 feet high. The South Branch Mill River flood plain immediately downstream of the dam site is owned and regulated by the City's Conservation and Park Commissions.
- 3.2 Evaluation - The m sonry dam was found to be in poor condition due to the partial failure at the right end of the dam and a number of pressure leaks through the dam. While the dam appears to be performing adequately at the present time, this damage offers potential for further deterioration under conditions of heavy flow. Similarly, although less likely, an increase in the channel wall seepage downstream of the abutments is possible and would certainly be undesirable. Consequently, based on the visual examination, there appears to be significant potential for future dam failure. The inaccessibility of the reservoir drain during high flows and the inoperative gate precludes the reduction of flow over the dam or the lowering of the reservoir level during times of emergency.

SECTION 3: VISUAL INSPECTION

3.1 Findings

- a. General - The Phase I visual examination of the Mill Pond Dam was conducted on 7 September 1978.

In general, the dam was observed to be in poor condition. The adjacent embankments were found to be in fair condition.

Visual inspection checklists for the site visit are included in Appendix A and selected photographs are given in Appendix C.

- b. Dam - The dam was constructed of stone masonry. A partial failure has occurred at the crest of the dam on the right hand side as shown in Photo Nos. 1, 2 and 8. A number of pressure leaks are present both in the failed area and along the entire length of the masonry dam at approximately one-third depth, as shown in Photo Nos. 1, 2, 4, 8 and 9. A major amount of debris is present just below the failed crest of the dam as shown in Photo Nos. 1 and 8. While the dam has no actual earth embankments, the materials behind each masonry abutment must serve to retain the water stored in Mill Pond. In this function, the abutment areas are generally in fair condition. There is no visual evidence of settlement or overall movement, but there is local erosion and downstream seepage.

The following specific items were noted:

- (1) There has apparently been soil erosion at the right abutment, adjacent to the area of spillway masonry damage.
 - (2) Seepage exits down from the channel walls on both sides, immediately downstream from the masonry dam structure. It is more extensive on the left side, as shown in Photo No. 4, where part is from joints in the horizontally bedded sandstone and part appears to be flowing over the surface of the bedrock. Minor seepage on the right side appears to be flowing over the rock surface. Soil particles were not evident in the seepage flow.
 - (3) Overhanging brush and tree branches, and weeds, brush and debris in the downstream channel, limit examination of the abutments and adjacent channel walls as shown in Photo No. 2, 3 and 4.
- c. Appurtenant Structures - The valve stem for the reservoir drain is located at the end of a metal platform which extends from the upstream

SECTION 2: ENGINEERING DATA

2.1 Design, Construction and Operation Records

No records pertaining to the design, construction or operation of the Mill Pond Dam were located and none are believed to exist.

2.2 Evaluation

Since no engineering records are available, the evaluation of the dam must be based primarily on the results of the visual examination which is detailed in Section 3.

(4) Recreation pool _____ 14.2 (Est.)

(5) Spillway crest _____ 14.2 (Est.)

g. Dam (also see spillway data)

(1) Type _____ stone masonry with over-flow spillway

(2) Length _____ 48-ft.

(3) Height _____ 13-ft.

(4) Top width _____ 30-in.

(5) Side slopes _____ Vertical D/S

(6) Zoning _____ Unknown

(7) Impervious core _____ Unknown

(8) Cutoff _____ Unknown

(9) Grout curtain _____ Probably None

h. Diversion and Regulating Facilities -----None

i. Spillway

(1) Type _____ stone masonry broad crested

(2) Length of weir _____ 48-ft

(3) Crest elevation _____ 206.4

(4) Gates _____ None

(5) U/S channel _____ 8-ft depth @ dam

(6) D/S channel _____ Slope = 0.053

(7) General _____ Crest is uneven with some stones missing on right side

j. Regulating Outlets - The only regulating outlet at this dam is a 24-inch pipeline through the dam itself. The estimated invert elevation of this pipeline is elevation 198.0. The line is controlled by a valve on the upstream side of the dam. Access to the valve is via a platform approximately at normal reservoir elevation.

c. Elevation (ft. above MSL)

- (1) Top of dam _____ 206.4
- (2) Test flood pool-design surcharge _____ 208.9
- (3) Design surcharge-original design _____ N/A
- (4) Full flood control pool _____ N/A
- (5) Recreation pool _____ 206.4
- (6) Spillway crest _____ 206.4
- (7) Upstream portal invert diversion tunnel _____ NONE
- (8) Streambed at centerline of dam _____ 193.1
- (9) Maximum tailwater _____ 195.2

d. Reservoir

- (1) Length of test flood pool _____ 2,800 ft. (Est.)
- (2) Length of recreation pool _____ 2,400 ft. (Est.)
- (3) Length of flood control pool _____ N/A

e. Storage (acre-feet)

- (1) Top of dam _____ 30 (Est.)
- (2) Test flood pool _____ 86 (Est.)
- (3) Flood-control pool _____ N/A
- (4) Recreation pool _____ 30 (Est.)
- (5) Spillway crest _____ 30 (Est.)

f. Reservoir Surface (acres)

- (1) Top of dam _____ 14.2 (Est.)
- (2) Test flood pool _____ 30.8 (Est.)
- (3) Flood control pool _____ N/A

- h. Design and Construction History - The dam is believed to have been constructed as a grist mill dam prior to 1900. No records of the original design and construction are available.
- i. Normal Operational Procedure - There is no established routine for operation of the dam. Mr. Al Poehler stated that a special gate operator handle was made for this dam but that the gate has not been operated in the past 3 to 5 years.

1.3 Pertinent Data

Elevations given in this report are on National Geodetic Vertical Datum (NGVD) formerly referred to as Mean Sea Level (MSL).

- a. Drainage Area - The South Branch Mill River drainage basin is moderately flat with steep mountainous slopes in the upper basin and considerable swamps and marsh areas in the middle and lower portions upstream of the dam site. Vegetation cover within the drainage area is heavy although substantial development has been occurring over the past 20 years. The total drainage area above the dam site is 9.6 square miles.
- b. Discharge at Dam Site - There are no records of discharges for the South Branch Mill River. The record rainfall for the area occurred from August 17 to 20, 1955 when approximately 16.5 inches of rain was recorded in the Springfield area during a 34-hour period.
 - (1) Outlet works (conduits) size: 24" and Invert Elev. (Est.)
 - (2) Maximum known flood at dam site _____ UNKNOWN
 - (3) Ungated spillway capacity at top of dam _____ N/A
 - (4) Ungated spillway capacity at test flood pool elevation
670 cfs @ 208.9 elev.
 - (5) Gated spillway capacity at normal pool elevation _____ N/A
 - (6) Gated spillway capacity at test flood pool elevation _____ N/A
 - (7) Total spillway capacity at test flood pool elevation
670 cfs @ 208.9 elev.
 - (8) Total project discharge at test flood pool elevation
670 cfs @ 208.9 elev.

- b. Description of Dam and Appurtenances - Mill Pond Dam consists of a stone masonry structure with a full-width overflow spillway at crest elevation 206.4. The structure is 48 ft. wide and approximately 13 ft. high, and has a gated outlet conduit that discharges through the vertical downstream face. A sketch plan prepared from the Phase I field inspection is shown in Appendix C.

The abutments of the dam are at the steep channel walls, with substantially no earth embankments that are part of the dam. The right abutment may be entirely against rock, there being an irregular rock and earth face exposed below the dam. The left abutment is at least partially against rock, but the upper part of the channel wall below the dam is stone masonry. It is likely that all or part of the earth behind the stone masonry wall was placed as fill for the adjacent Parker Street (Route 21) roadway embankment. Brush and tree branches overhang each abutment.

A 24-in. diameter steel drain at an estimated invert elevation of 198.0 passes through the masonry dam at approximately the 1/3 point from the right abutment. A gate of unknown type is located on the upstream end of the 24-in. drain and was inoperable at the time of inspection on 7 September 1978.

- c. Size Classification - The hydraulic height of the masonry dam is approximately 13 feet and the estimated storage capacity at crest elevation is 30 acre-feet. According to guidelines established by the Corps of Engineers, the dam is classified in the small category.
- d. Hazard Classification - The dam has been classified by the Corps of Engineers as having a "low" hazard potential. Based on the results of the dam failure analysis which indicates that no structures would be affected and that the only probable damages would be to secondary roads and utilities, it is recommended that this classification be retained.
- e. Ownership - The pond and dam are owned by the City of Springfield. The Owner's address is: City of Springfield, 36 Court Street, Springfield, MA 01103 (Phone: 413/736-2711). Mr. Richard Wiese of the City Engineering Department acted as the owner representative during this investigation.
- f. Operator - Operation of the dam is the responsibility of the City Park Department. Mr. Richard Fitch (Phone: 413/732-2181) is the Park Department Superintendent. Mr. Al Poehler is the Park Department foreman in charge of operations.
- g. Purpose of Dam - Mill Pond, upstream of Parker Street, is presently used for recreational purposes.

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
MILL POND DAM
MA 00575

SECTION 1: PROJECT INFORMATION

1.1 General

- a. Authority - Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region.

Camp Dresser & McKee Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued to Camp Dresser & McKee Inc. under a letter of 12 July 1978, from Colonel John P. Chandler, Corps of Engineers. Contract No. DACW 33-78-C-0354 has been assigned by the Corps of Engineers for this work. Haley and Aldrich, Inc. has been retained by Camp Dresser & McKee Inc. for the soils and geological portions of the work.

- b. Purpose - The primary purpose of the investigation is to:
- (1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.
 - (2) Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.
 - (3) Update, verify and complete the National Inventory of Dams.

1.2 Description of Project

- a. Location - Mill Pond Dam is located on the South Branch Mill River, approximately 90 feet downstream of Parker Street, in the City of Springfield, as shown on the report's Location Map. The South Branch Mill River joins the North Branch at Watershops Pond from which they discharge to the Connecticut River.

APPENDIX A

INSPECTION TEAM ORGANIZATION AND CHECK LIST

	<u>Page No.</u>
<u>VISUAL INSPECTION PARTY ORGANIZATION</u>	A-1
<u>VISUAL INSPECTION CHECK LIST</u>	
Embankment Dam	A-2
Spillway	A-3
Outlet Works: Reservoir Drain	A-4
Hydrologic-Hydraulic Considerations	A-5
Plan Sketch of Mill Pond Dam	A-6

VISUAL INSPECTION PARTY ORGANIZATION
NATIONAL DAM INSPECTION PROGRAM

DAM: Mill Pond

DATE: September 7, 1978

TIME: 3:45 p.m.

WEATHER: Partly cloudy, 70-75° F, lt. w. wind

WATER SURFACE ELEVATION UPSTREAM: E1. 206.5± (0.1' over crest)

STREAM FLOW: about 5 cfs

INSPECTION PARTY:

1. Roger H. Wood
 2. Joseph E. Downing
 3. Charles E. Fuller
 4. Peter LeCount - Haley & Aldrich
 5. _____
 6. _____
- CDM

PRESENT DURING INSPECTION:

1. Park Dept. Representative
2. _____
3. _____
4. _____

VISUAL INSPECTION CHECK LIST
NATIONAL DAM INSPECTION PROGRAM

DAM: Mill Pond

DATE: 9/7/78

EMBANKMENT: Dam

CHECK LIST	CONDITION
<p>1. Upstream Slope</p> <ul style="list-style-type: none"> a. Vegetation b. Sloughing or Erosion c. Rock Slope Protection - Riprap Failures d. Animal Borrows <p>2. Crest</p> <ul style="list-style-type: none"> a. Vegetation b. Sloughing or Erosion c. Surface cracks d. Movement or Settlement <p>3. Downstream Slope</p> <ul style="list-style-type: none"> a. Vegetation b. Sloughing or Erosion c. Surface cracks d. Animal Borrows e. Movement or Cracking near toe f. Unusual Embankment or Downstream Seepage g. Piping or Boils h. Foundation Drainage Features i. Toe Drains <p>4. General</p> <ul style="list-style-type: none"> a. Lateral Movement b. Vertical Alignment c. Horizontal Alignment d. Condition at Abutments and at Structures e. Indications of Movement of Structural Items f. Trespassing g. Instrumentation Systems 	<p>NOTE: Dam does not appear to have embankment as such. Masonry is carried to abutments, which are earth over rock. Right side appears to have thin natural earth cover over rock (sandstone) with rock spine outcropping 30ft.± from dam. Left side is earth fill over rock, with 6-8 ft. high stone masonry retaining walls. Rte. 21 (approx. 45 ft. pav't. width) is on the fill.</p> <p>1. a. Grass, weeds, brush, occasional trees. b. Not evident c. None d. None observed.</p> <p>2. a. Mostly grass b. Local paths c. Not evident d. Not evident</p> <p>3. a. Weeds, brush, trees b. Few fallen stones, local erosion from foot traffic c. Not evident d. None observed e. Not evident f. Local seepage from horizontal rock joints or soil/rock interface on both sides. g. None observed h. None i. None</p> <p>4. a.,b.,c. No alignment as such; possible retaining wall movement. d. Seepage down over rock close to left abutment, right covered by debris. e. See spillway checklist f. Foot traffic g. None</p>

VISUAL INSPECTION CHECK LIST
NATIONAL DAM INSPECTION PROGRAM

DAM: Mill Pond Dam

DATE: September 7, 1978

SPILLWAY: _____

CHECK LIST	CONDITION
1. Approach Channel a. General Condition b. Obstructions c. Log Boom etc.	1.a. Good b. Small debris at crest c. None
2. Weir a. Flashboards b. Weir Elev. c. Vegetation d. Seepage or Efflorescence e. Rust or Stains f. Cracks g. Condition of Joints h. Spalls, Voids or Erosion i. Visible Reinforcement j. General Struct. Condition	2.a. None b. El. 206.4 c. Vegetation at abutments d. At least four pressure leaks through masonry joir. plus several non-pressure leaks. Rt. crest for 6'+ has partial collapse plus leakage. e. N.A. f. No cracks observed - partial failure see 2d. g. Open joints - much leakage h. See 2g and 2d i. N.A. j. Poor
3. Discharge Channel a. Apron b. Stilling Basin c. Channel Floor d. Vegetation e. Seepage f. Obstructions g. General Struct. Condition	3.a. Natural Rock b. None c. Natural rock adjacent to dam. d. Brush & tree growth on sides. e. From sides of banking. f. Debris from Rt. side partial collapse plus trash (shopping carts etc.). g. Fair
4. Walls a. Wall Location _____ (1) Vegetation (2) Seepage or Efflorescence (3) Rust or Stains (4) Cracks (5) Condition of Joints (6) Spalls, Voids or Erosion (7) Visible Reinforcement (8) General Struct. Condition	4.a. Stone walls Lt. side DS. (1) Brush & trees adjacent to walls. (2) Seepage present (3) Stain present (4) N.A. (5) Open joints (6) Some stones have fallen from walls. (7) N.A. (8) Fair to Poor

VISUAL INSPECTION CHECK LIST
NATIONAL DAM INSPECTION PROGRAM

DAM: Mill Pond

DATE: September 7, 1978

OUTLET WORKS: Reservoir Drain

CHECK LIST	CONDITION
1. Inlet a. Obstructions b. Channel c. Structure d. Screens e. Stop Logs f. Gates	1.a. Not visible b. Unknown c. Metal work-inaccessible during high water-poor d. NA e. NA f. Unknown
2. Control Facility a. Structure b. Screens c. Stop Logs d. Gates e. Conduit f. Seepage or Leaks	2.a. See 1c b. NA c. NA d. See 1f e. Not visible f. Underwater
3. Outlet a. Structure b. Erosion or Cavitation c. Obstructions d. Seepage or Leaks	3.a. Pipe through weir-24 inch b. Not visible c. Debris from partial weir collapse in front of outlet d. Small flow of water coming through pipe.
4. Mechanical and Electrical a. Crane Hoist b. Hydraulic System c. Service Power d. Emergency Power e. Lighting f. Lightning Protection	4. Not applicable

VISUAL INSPECTION CHECK LIST
NATIONAL DAM INSPECTION PROGRAM

DAM: Mill Pond

DATE: 9/7/78

HYDROLOGIC-HYDRAULIC CONSIDERATIONS:

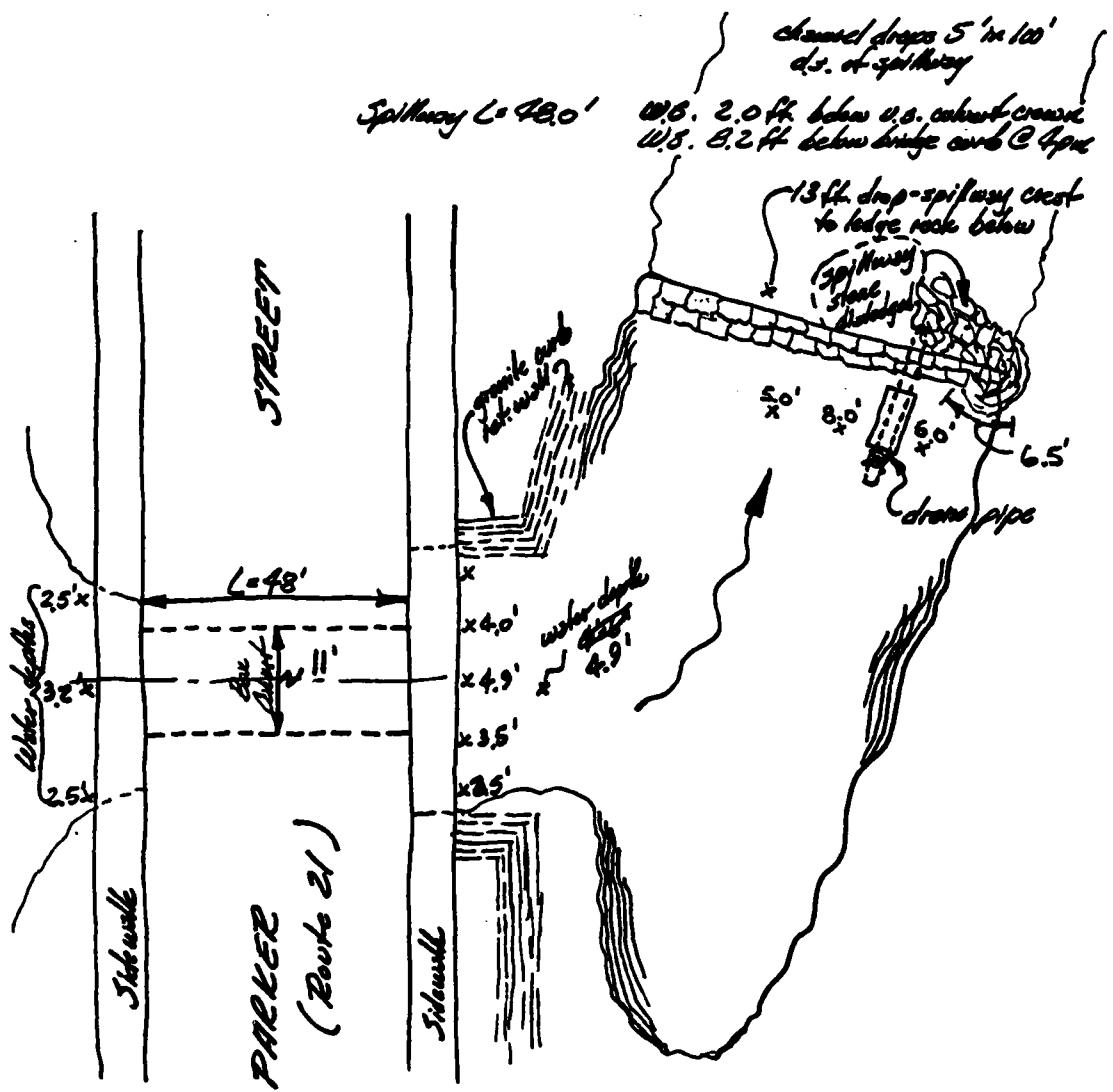
CHECK LIST	CONDITION
1. Upstream Watershed a. Type of Terrain b. Hydrologic Controls	1. a. Moderate to steep along easterly divide of watershed (Wilbraham Mtn.) then flattening in developing residential areas to westward b. Two large and one smaller swampy area occupy more than 500 acres. No other hydrologic controls.
2. Reservoir a. Type of Terrain b. Development	2. a. Shoreline of pond relatively flat. b. Some restricted development.
3. Spillway a. Adjacent Low Points b. Spillway Approach (Slope) c. Spillway Discharge (Slope) d. Spillway Type	3. a.,b.,c.,d. Masonry stone spillway about 50 ft. long and max. ht. of 14-15-ft. Failure of spillway stone @ right abutment about 6' long by 9-12" deep with stone @ foot of spillway. Approach slope very mild with average pool depth of 5-6 ft.
4. Downstream Watershed a. Reach No. (1) Control (Bridge, dam, culvert, etc.) (2) Channel Characteristics (3) Development (4) Visible Utilities (5) Special Problems (Hospital, etc.)	4(1),(2),(3) Downstream watershed is residentially developed; however, South Branch Park occupies left bank; golf course occupies right bank. No development adjacent to channel which is in deep ravine for 1.5 miles to Bradley Road. Dam failure would not be a high hazard factor. (4) None. (5) None.

CAMP DRESSER & MCKEE
Environmental Engineers
Boston, Mass.

CLIENT _____
PROJECT _____
DETAIL Mill Pond Dam

JOB NO. _____
DATE CHECKED _____
CHECKED BY _____
COMPUTED BY _____

PAGE Sept 7 1972
DATE 1972



APPENDIX B

LIST OF AVAILABLE DOCUMENTS AND
PRIOR INSPECTION REPORTS

Page No.

LIST OF AVAILABLE DOCUMENTS

- | | |
|-------------------------------|-----|
| 1. List of Plans and Sketches | B-1 |
|-------------------------------|-----|

PRIOR INSPECTION REPORTS

<u>DATE</u>	<u>BY</u>	
March 22, 1976	Mass. Dept. of Public Works	B-2
Unknown	Tigh & Bond	B-7

LIST OF PLANS AND SKETCHES

MILL POND DAM

<u>DOCUMENT</u>	<u>CONTENTS</u>	<u>LOCATION</u>
1. Parker St. Reconstruction	Location of Culvert from Mill Pond to South Branch of Mill River, Location of Mill Pond Culvert under Parker Street	Springfield Dept. of Public Works Engineering Dept. 36 Court Street Springfield, MA 01103
2. Parker St. Culvert	Plan of Culvert on Parker Street over South Branch of Mill River	See above

INSPECTION REPORT - DAMS AND RESERVOIRS

ITION:

~~Owner~~ Springfield County Hampden Dam No. 2-7-281-1

of Dam Sixteen Acres Pond "Mill Pond".

Mass. Rect.

Sheet No. 15 C. Coordinates: N 406,800, E 328,700.

pected by: Harold T. Shumway, On March 22, 1976. Date Last Inspection 2-21-71.

WER/S: As of March 22, 1976

As Assessors _____, Reg. of Deeds _____, Prev. Insp. X, Per. Contact X.

City of Springfield
Park Commission, Park Department, Forest Park Office, Springfield, Mass.

Name	St. & No.	City/Town	State	Tel. No.

Name	St. & No.	City/Town	State	Tel. No.

Name	St. & No.	City/Town	State	Tel. No.

RETAILER: (if any) e.g. superintendent, plant manager, appointed by
absentee owner, appointed by multi owners.

Mr. Albert Poehler

Deputy Supt. for Maintenance, Park Dept., Forest Park Office, Springfield, Mass.

Name	St. & No.	City/Town	State	Tel. No.

DATA:
No. of Pictures Taken None. Sketches See description of Dam.
Plans, Where No detailed plan located.

EGREE OF HAZARD: (if dam should fail completely)*

1. Minor _____. 3. Severe _____.

2. Moderate X _____. 4. Disastrous _____.

COMMENTS: Approximately 25 million gallons impoundment - most of released water should
be accommodated in Watershops Pond.

This rating may change as land use changes (future development).

OUTLETS: OUTLET CONTROLS AND DRAWDOWN

No. 1 Location and Type: At dam - stone masonry spillway - 48' W. x 4' H. with stone masonry dropwall 14' - high.

Controls None, TYPE: _____.

Automatic _____. Manual _____. Operative Yes ____, No _____.

Comments: Red stone ledge at bottom of dropwall - westerly end of spillway unravels.

No. 2 Location and Type: 18' from westerly end of dam - drawdown consisting of unknown size.

Controls Yes, Type: Screw operated gate or valve.

Automatic _____. Manual _____. Operative Yes X, No _____.

Comments: Outlet opening of drawdown sluice buried under debris.

No. 3 Location and Type: _____.

Controls _____, Type: _____.

Automatic _____. Manual _____. Operative Yes ____, No _____.

Comments: _____.

Draudown present Yes X, No _____. Operative Yes X, No _____.

Comments: See No. 2 above - Park Dept. personnel state gate is operable.

AMI UPSTREAM FACE: Slope Vertical, Depth Water at Dam 8' Stone

Material: Turf _____. Brush & Trees _____. Rock fill _____. Masonry X. Wood _____.

Other _____.

Condition: 1. Good _____. 3. Major Repairs X _____.

2. Minor Repairs _____. 4. Urgent Repairs _____.

Comments: Spillway crest unraveling - 2 capstones misplaced on crest. Looked noted through dropwall and ledge crevices. Misplaced stones in dropped riprap made of curbing on easterly bank.

AMI DOWNSTREAM FACE: Slope Vertical _____.

Material: Turf _____. Brush & Trees _____. Rock Fill _____. Masonry X. Wood _____.

Other _____.

Condition: 1. Good _____. 3. Major Repairs X _____.

2. Minor Repairs _____. 4. Urgent Repairs _____.

See Item #7 above - water flow beginning to erode bank where curbing ends.

GENCY SPILLWAY: Available None. Needed _____.

ight Above Normal Water: _____ Ft.

depth _____ Ft. Height _____ Ft. Material _____.

- ondition: 1. Good _____. 3. Major Repairs _____.
2. Minor Repairs _____. 4. Urgent Repairs _____.

omments: Entire dam is overflow spillway.

WATER LEVEL AT TIME OF INSPECTION: 1/2 Ft. Above X. Below _____.

Top Dam _____ F.L. Principal Spillway X _____.

Other _____.

Normal Freeboard 4± Ft.

MMARY OF DEFICIENCIES NOTED:

Growth (Trees and Brush) on Embankment dam - some damage from root growth
Westerly end of spillway crest gone - water action

Animal Burrows and Washouts is cutting into bank

Damage to Slopes or Top of Dam Yes - crest unraveling - See Items #7 and #8

Cracked or Damaged Masonry Yes - See Items #7 and #8

Evidence of Seepage Yes - seepage noted on both ends of dam

Evidence of Piping None found

Leaks Yes - see Item #7

Erosion Yes - bank on westerly end of spillway wearing away

Trash and/or Debris Impeding Flow None found

Clogged or Blocked Spillway None found

Other Considerable amount of debris at toe of dropwall

4. CONDITION:

Safe _____.

Minor repairs needed _____.

Conditionally safe - major repairs needed _____.

Unsafe _____.

Reservoir impoundment no longer exists (explain)

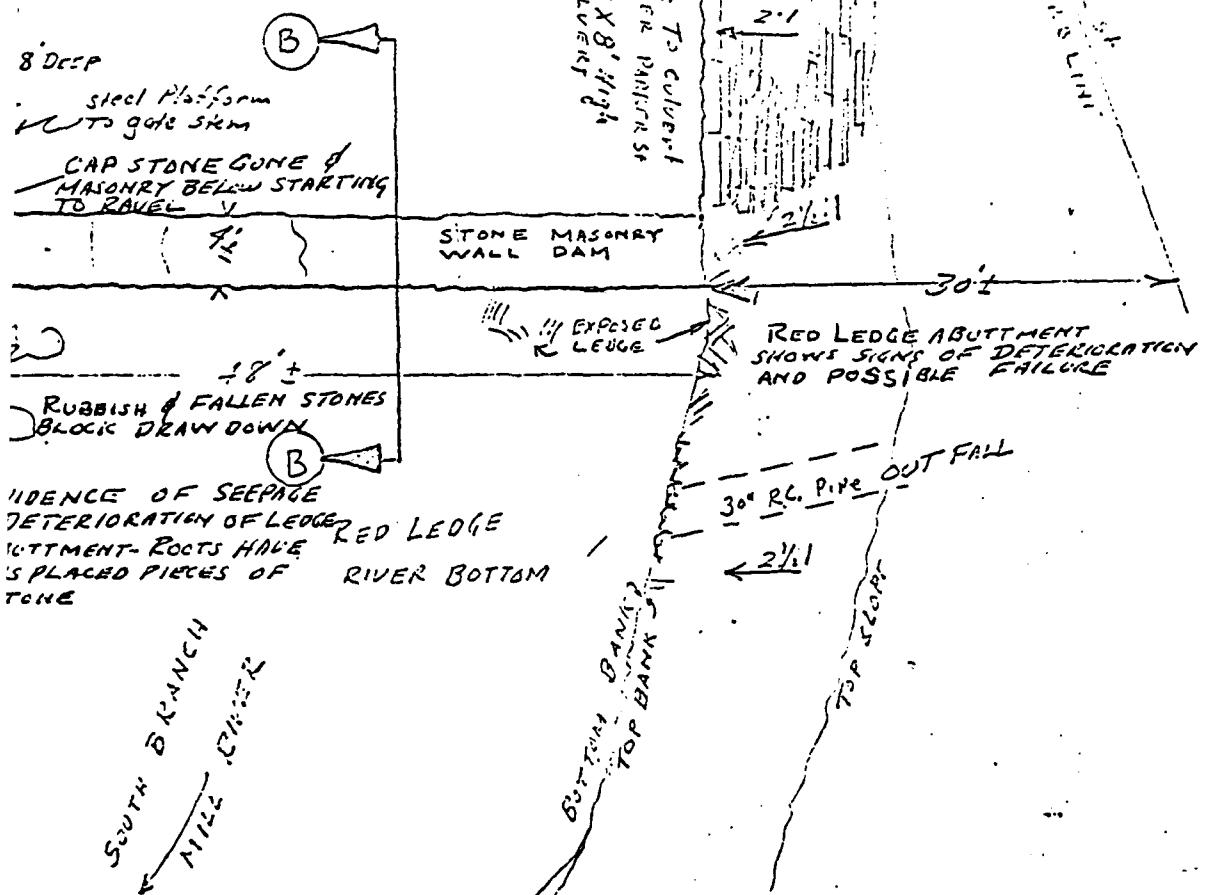
Recommend removal from inspection list _____.

5. NOTES AND RECOMMENDATIONS: (Fully Explain)

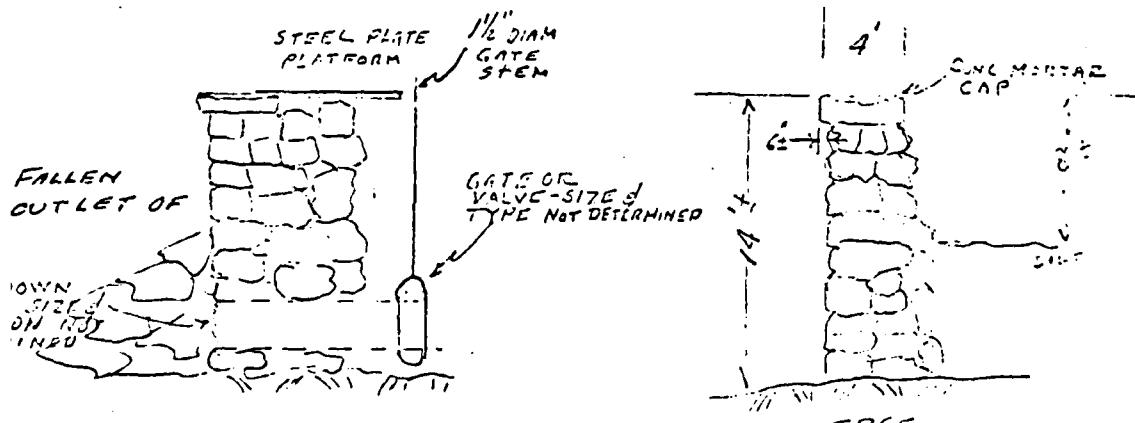
In the last inspection of 2-21-1974, the owners of this dam have had a preliminary investigation and estimate made of repairs for dam by an engineering consulting firm per word of Mr. A. Poehler, Deputy Superintendent for Park Maintenance. However, no repairs have been made to date and spillway at westerly end of dam is continuing to unravel. Leaks and seepage have increased through wall and abutments and seepage flows were noted in ledge fissures below dam. Loss of capstones and abutment stone is allowing erosion of river bank at spillway crest level on westerly side of dam. Continued erosion in this area could cause a failure of westerly end of spillway dropwall and consequent failure of entire dam. The Park Department is aware of this problem but stated that they were waiting for lower water levels before attempting repairs. Because of present condition and potential for further rapid deterioration, the District considers this dam as unsafe.

7K

IXTEEN ACRES MILL POND



PLAN - NOT TO SCALE



ITH INSPECTION REPORT DTD. FEB 21, 1974

116

APPENDIX B-6

CAMP DRESSER & MCKEE
Environmental Engineers
Boston, Mass.

CLIENT CCE
PROJECT DAM INSP.
DETAIL MILL POND

JOB NO 380-5-07
DATE CHECKED 10-19-78
CHECKED BY Miller
PAGE 3 of 5
DATE 1-12-79
COMPUTED BY ED

DAM FAILURE OUTFLOW = 1500 cfs
Flood study reveals that significant ponding exists
between damsite and Phillips Road which will
reduce flows - however, to be conservative, no
testing will be done.

STAGE - DISCHARGE RELATIONSHIP @ Phillips Rd.:

$$\text{ELEV. } 1500 \text{ cfs} = (1726 - 1674) / (1180 - 820) \times (1500 - 1180) + 112.8 = 175.6$$

A review on the USGS Quad Sheets indicates no
structures below ELEV. 180.0

Since Wintersport Park is located downstream
of Phillips Rd. with sufficient capacity to
accommodate the 1500 cfs discharge, it is
considered that the only impacts would be
to bridges, roads and slopes and possibly
some minor residential property damage along
along the shore line of Wintersport Park.

Therefore, the hazard category is Low.

CAMP DRESSER & MCKEE
Environmental Engineers
Boston, Mass

CLIENT CCE PROJECT DAM INSP DETAIL MILL RIVER JOB NO 360-S-07 DATE CHECKED 10-18-78 CHECKED BY DR PAGE 2 of 5 DATE 1-2-79 COMPUTED BY JED

was found that the Tarter St. Culvert controlled the head level at high flows, rather than the dam. This finding was incorporated into the routing.

As the difference between the 50 & 100-year floods is small, the 100-yr should be adopted as the TEST FLOOD

$$\begin{aligned} \text{TEST FLOOD} &= 370 \text{ cfs INFLOW + GTCFS OUTFLOW} \\ " &\quad \text{STAGE} = \text{Elev. } 208.9 \\ " &\quad \text{HEAD ON DAM} = 2.5 \text{ ft.} \end{aligned} \quad \left. \begin{array}{l} \{ "C" = 2.5 \text{ ft} \\ L = 48 \text{ ft} \end{array} \right\}$$

DAM FAILURE ANALYSIS

$$\begin{aligned} Q_2 &= 8/27 W_b - \frac{2}{3} Y_0^{3/2} \\ &= 8/27 (48 \times 1.4) (32.5)^{1/2} (12.3)^{3/2} = 1566 \text{ cfs OUTFLOW} \end{aligned}$$

NOTE:

Max. water depth at upstream face of dam 6 ft.
However, max. water depth at upstream face
of Tarter St. Culvert with water level at
dam level is only 3.2 ft.

∴ amount of stored water that could be
released in the event of a dam failure is
less than the estimated 30 ac-ft or total
storage.

The channel downstream of the dam is
a deep gorge with sufficient size and
slope to pass the 1566 peak return
outflow.

The results of the Flood Insurance Study
indicate that flooding along the South Branch
Mill River, between the dam site and
Watershed Road is mitigated by the Flume
Road bridge.

Post-tension date on this bridge is:

INV. EL. = 153.0
ELEV OF CROWN EL = 154.5
TOP OF RIVER EL = 154.5
100YR Q = 620 cfs C.E. 124.4
500YR Q = 1,620 cfs C.E. 172.5

GAMP DRESSER & McKEE
Environmental Engineers
Boston, Mass

CLIENT CCE
PROJECT DAM INSP
DETAIL MILL PARK

JOB NO 3EC-5-C9
DATE CHECKED 10-19-78
CHECKED BY OT
PAGE 1 of 5
DATE 10-15-78
COMPUTED BY ED

SIZE CLASSIFICATION

HYDRAULIC HEIGHT: Top of Dam (Spillway Crest) = El. 206.4
Tee of Box Culvert = El. 193.1
 $\frac{13.3 \text{ ft.}}{13.3 \text{ ft.}}$

STORAGE @ TOP OF DAM = 30 sec-³

∴ SIZE CLASSIFICATION IS SMALL

HAZARD POTENTIAL

The downstream channel consists of "gorge" with two culverts between the dam and Millhouse Pond. All development along the channel is approx. 20 ft. + above South Branch Mill River.

In the event of a dam failure, only a portion of the pond would be discharged as the invert of the box culvert under Parker St. (100' upstream of dam) is only 3.2 ft. msl. below the dam crest. Therefore, a dam failure would only lower the pond by 3.2 feet.

Therefore, the apparent hazard is LOW

TEST FLOOD

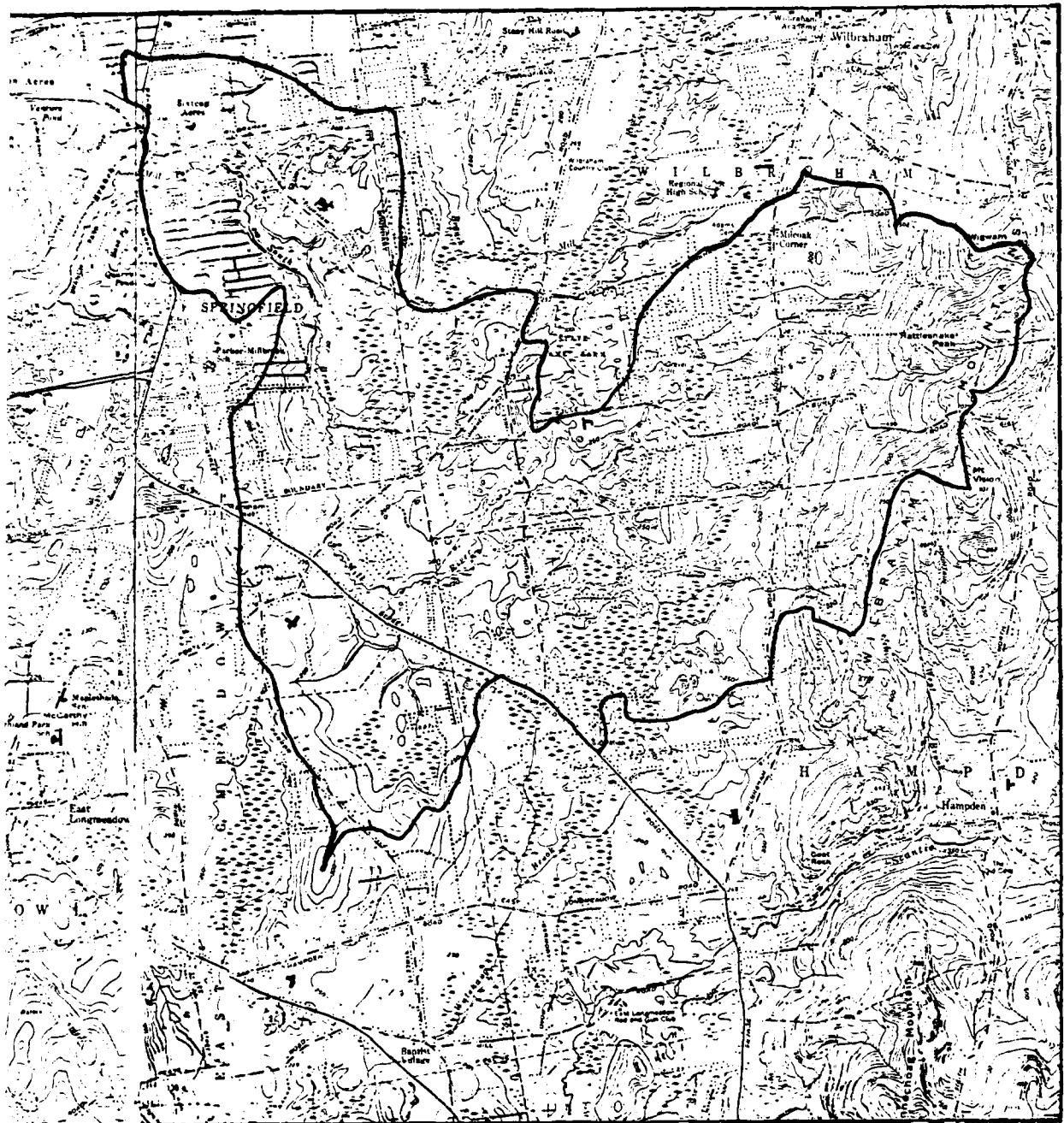
SIZE SMALL & HAZARD LOW, TEST FLOOD 50 to 100-yr

OTHER STUDIES

A preliminary Flood Insurance Study (FIS) performed by CDM under contract with HUD/FIA determined the following flows at the damsite:

	AT PARKER ST.	AT DAM	ELEV.
10-YR	450 cfs	365 cfs	206.1
50-YR	740 cfs	590 cfs	205.7
100-YR	870 cfs	670 cfs	205.9
500-YR	1,250 cfs	900 cfs	207.6

The above flows were developed using Johnson's Method and were rounded flow Mill Park. The routing required the development of Stage-Duration Relationships for Mill Park crest on the Dam & Parker St. Culvert. It
(continued)



CAMP DRESSER & MCKEE Inc.
Consulting Engineers
Boston, Mass.



MILL POND (SIXTEEN ACRES)
DAM
DRAINAGE AREA MAP
SCALE: 1": 4000'

APPENDIX D-1

APPENDIX D
OUTLINE OF DRAINAGE AREA AND
HYDRAULIC COMPUTATIONS

Page No.

OUTLINE OF DRAINAGE AREA

Drainage Area Map 1

COMPUTATIONS

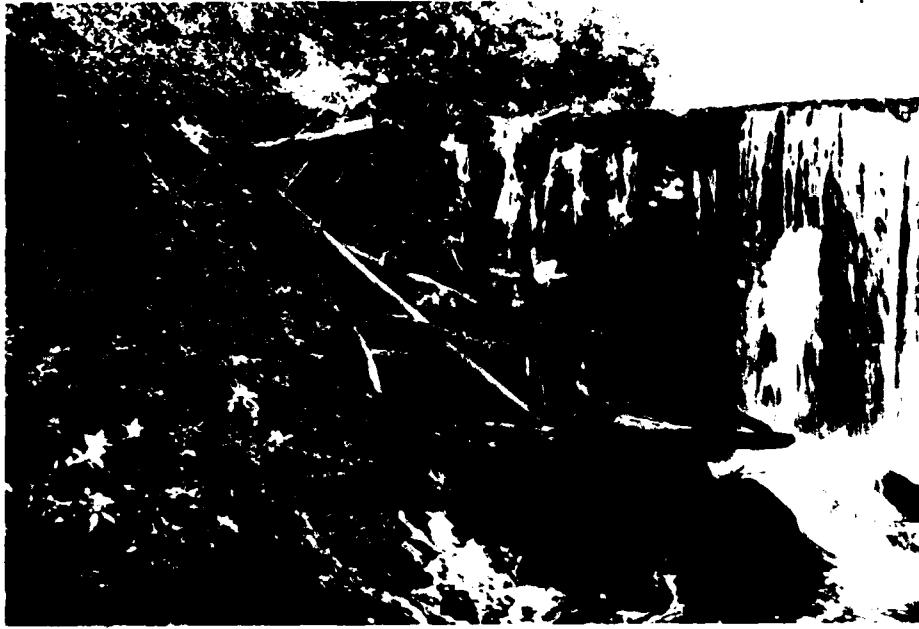
Size Classification; Hazard Potential; Test Flood;	
and Other Studies	2
Dam Failure Analysis	3
Dam Failure Analysis - cont'd	4
South Branch Mill River Profile and Dam Elevation	5
Discharge Rating and Storage Rating Curves	6



10. STONE RETAINING WALL AT DOWNSTREAM LEFT EMBANKMENT.



11. VIEW OF PARTIAL FAILURE OF DAM CREST IN FOREGROUND (RIGHT ABUTMENT) AND CONTROL PLATFORD WITH GATE OPERATOR STEM IN CENTER OF PHOTOGRAPH.



8. PARTIAL FAILURE OF DAM CREST AND RESULTING DEBRIS NEAR RIGHT ABUTMENT OF DAM. VIEW OF POND DRAIN PIPE OBSCURED BY DEBRIS. NOTE PRESSURE LEAKS IN DAM.



9. PRESSURE LEAKAGE THROUGH DAM NEAR LEFT ABUTMENT OF DAM.



6. LOOKING NORTH TOWARDS MILL POND CULVERT ALONG PARKER STREET.



7. LOOKING EAST FROM PARKER STREET OVER MILL POND.



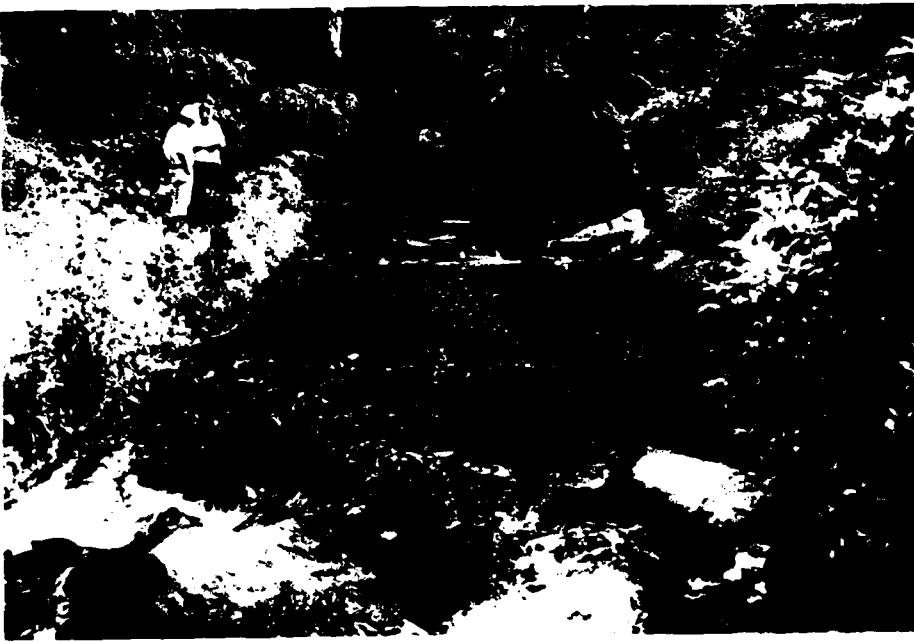
4. VIEW OF DAM AND DRAINAGE PIPE OUTLET. NOTE PRESSURE LEAKAGE THROUGH DAM AND ROCK FALL FROM DRAINAGE PIPE AREA.



5. VIEW OF PARKER STREET CULVERT FROM DAM.



2. OVERVIEW OF DAM AND DOWNSTREAM CHANNEL.



3. VIEW OF DOWNSTREAM CHANNEL FROM BASE OF DAM.

MILL POND

PARKER STREET

Control Platform

DAM
Pond Drain

PLAN OF DAM

N

Note: ① denotes direction of view
and photograph number.

NATIONAL PROGRAM OF INSPECTION
OF NON FEDERAL DAMS
LOCATION OF PHOTOGRAPHS
MILL POND DAM
SPRINGFIELD MASSACHUSETTS

APPENDIX C

SELECTED PHOTOGRAPHS OF PROJECT

Page No.

LOCATION PLAN

Location of Photographs

C-1

PHOTOGRAPHS

<u>No.</u>	<u>Title</u>	<u>Page No.</u>
1.	Overview of Dam From Downstream	Follows Table of Contents
2.	Overview of Dam & Downstream Channel	C-2
3.	Downstream Channel From Base of Dam	C-2
4.	View of Dam and Drainage Pipe	C-3
5.	View of Parker St. Culvert From Dam	C-3
6.	Looking North Toward Mill Pond Culvert Along Parker St.	C-4
7.	Looking East From Parker St. Over Mill Pond	C-4
8.	Partial Failure of Dam Crest Near Right Abutment	C-5
9.	Pressure Leakage Through Dam Near Left Abutment	C-5
10.	Stone Retaining Wall at Downstream Left Embankment	C-6
11.	Partial Failure of Dam Crest, Right Abutment	C-6

ND CONSULTING ENGINEERS

The face of the dam stone masonry in general was noted to be o. k. On the face, at the left side of the dam just below the crest, a cavity still exists but it has not increased in depth or area. The cavity will be watched in future inspections.

In the opinion of the undersigned, this dam is in satisfactory condition and is considered to be safe.

F. Springfield Park Department Dam, Breckwood Park

The dam, spillway and the conduit thru the embankment were all noted to be in good condition. Concrete is in very good condition. Water level in storage was at the crest of the concrete overflow and no flashboards were on the crest.

The embankment at this dam is very wide in relation to its height. The embankment carries a wide paved roadway. The roadway is in good condition. There is no evidence of any settlement or cracking of the pavement.

Tree growth occurs on the slopes of the embankment but because of the great width of this embankment, the tree growth does not endanger the dam in any way.

The surface of the embankment is eroded on both slopes in the vicinity of the spillway conduit location. This erosion apparently results from foot traffic. It does not endanger the dam in any way.

On the downstream side of the dam at the top edge, masonry retaining walls are failing and are leaning downstream. This failure has been reported to the Park Dept. in the past. Loss of these walls does not affect the dam in any way insofar as safety of the dam itself is concerned.

In the opinion of the undersigned, the dam is safe.

G. Monsanto Chemical Company Upper Dam

The embankment forming this dam is in fair condition. All brush growth on the downstream slope and along the downstream toe of the dam should be removed. The downstream surface of the dam should be loamed, seeded and fertilized so as to develop a good turf cover.

CONSULTING ENGINEERS

The face of the stone wall just downstream of the spillway and on the upstream side of the embankment, as viewed from the spillway, is eroding at the lower left and a shallow cavity is forming. This condition is not bad as yet. The cavity will be observed during the inspection next year and any extension of the cavity will then be reported to your Board with a recommendation that the Park Commissioners be notified.

The embankment of the dam was o.k. Trees and brush growing from the slopes do not endanger the dam because of the great width of this embankment in relation to its shallow height. The road extending along the top of the dam is in good condition.

The arch spillway conduit and the repaired masonry walls within the conduit were all noted to be in good condition.

In the opinion of the undersigned, this dam is safe.

D. U. S. Government Dam at Watershops Pond

This dam apparently is now under the control and jurisdiction of the City of Springfield.

The dam was noted to be in good condition. The masonry overflow structure was o.k. Abutments were good.

The movable crest gate is partly rolled down and is in good condition. Water level in storage was at the crest of the spillway movable gate.

The toe area in the bed of the stream was satisfactory. The dam has been constructed on ledge which is exposed at the toe.

In the opinion of the undersigned, this dam is in good condition and is safe.

E. Springfield Park Department Dam, Sixteen Acres Pond

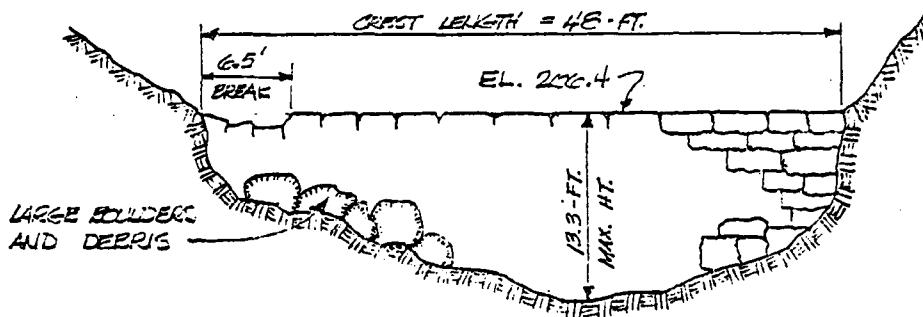
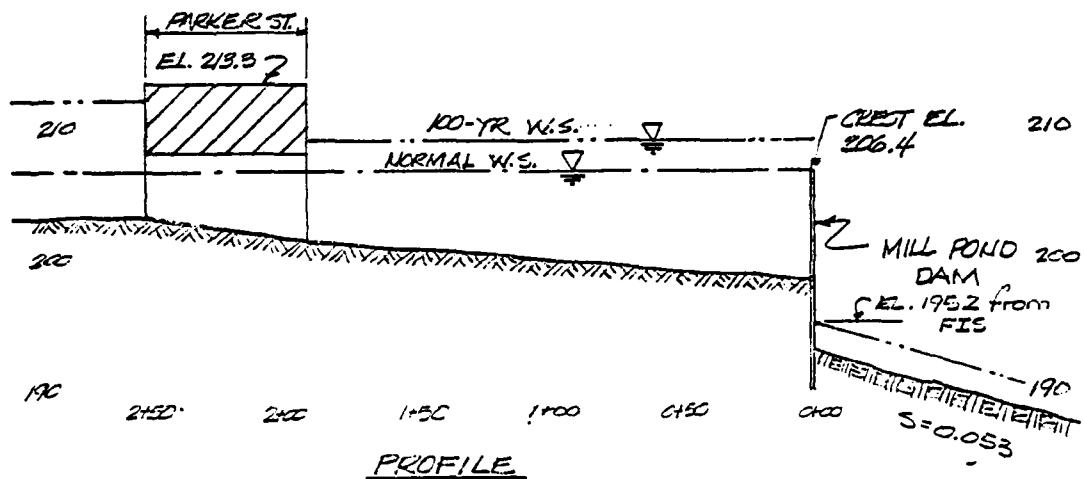
The abutment areas at this dam have been improved by the removal of the tree growth. The crest of the dam is in fair condition and it is on fairly good grade and alignment. On the day of inspection water was overflowing the crest. No flashboards were on the crest.

CAMP DRESSER & MCKEE
Environmental Engineers
Boston, Mass

CLIENT CCE
PROJECT DAM INCH
DETAIL MILL POND

JOB NO 260-5-09
DATE CHECKED 10-18-78
CHECKED BY Walter

PAGE 4 of 5
DATE 9-28-78
COMPUTED BY JED



ELEV.	HEAD	Q (cfs)	SURFACE AREA (ac.)	STORAGE (ac.-ft.)
206.4	0	0	14.2	$14.2 \times 6 \times \frac{1}{2} = 28.4$ say 30
207.0	0.6	76	16.2	$30 + (14.2 + 16.2)/2 \times .6 = 40$
207.6	1.6	340	24.6	$40 + (16.2 + 24.6)/2 \times 1 = 61$
209.0	2.6	704	31.5	$61 + (24.6 + 31.5)/2 \times 1 = 87$
210.0	3.6	1150	35.1	$87 + (31.5 + 35.1)/2 \times 1 = 124$

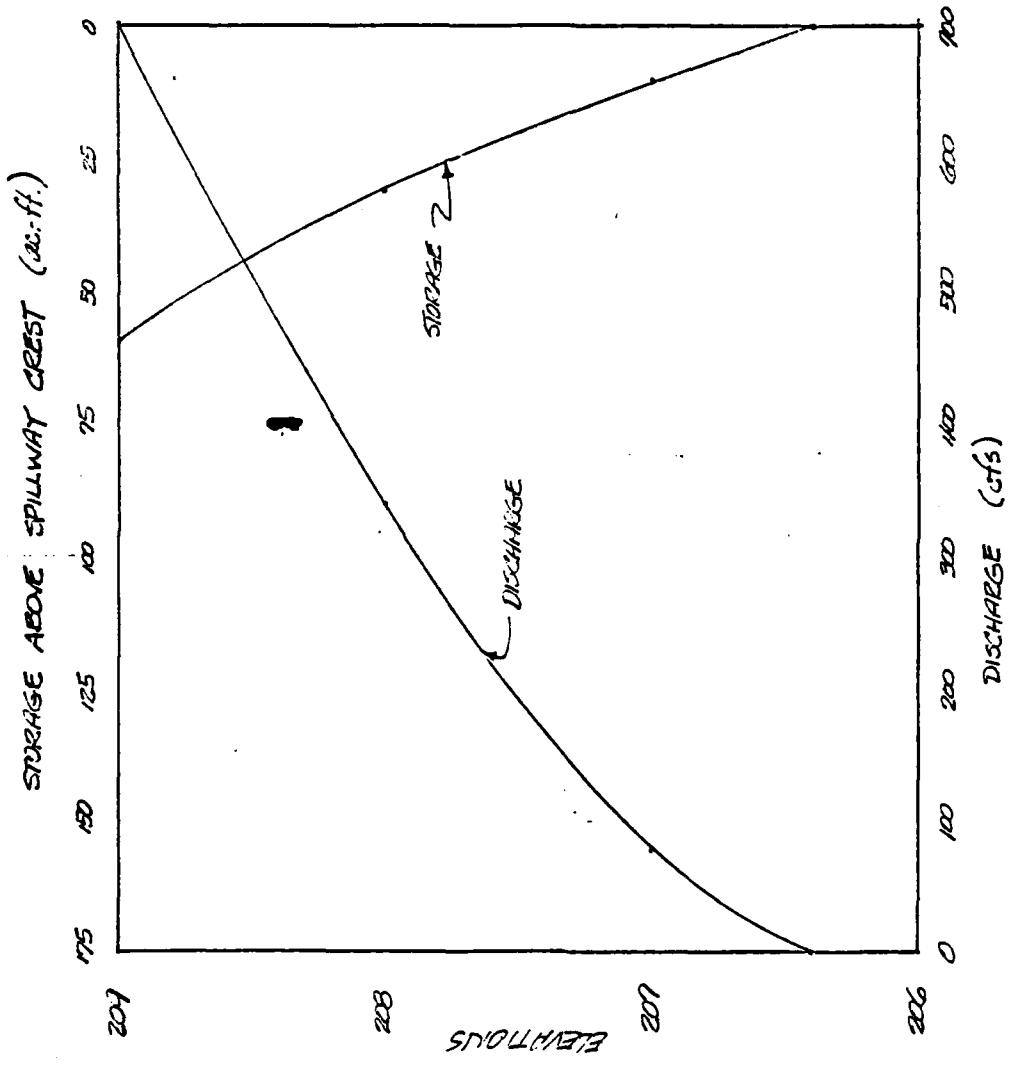
CAMP DRESSER & MCKEE
Environmental Engineers
Boston, Mass.

CLIENT CCE
PROJECT DAM INSPECTION
DETAIL MILL RND

JOB NO 380-5-09
DATE CHECKED _____
CHECKED BY _____

PAGE 5 of 5
DATE 11-30-76
COMPUTED BY JED

DISCHARGE AND STORAGE RATING CURVES



APPENDIX E
INFORMATION AS CONTAINED IN
THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
STATE NUMBER	DIVISION	STATE	COUNTY	STATE	COUNTY	CONC. UNIT.	NAME	NAME	LATITUDE NORTH	LONGITUDE (WEST)	REPORT DATE	
MA 575	NED	MA 013	02				MILL POND DAM		42°06'7	72°24'.9	07SEP78	

POPULAR NAME	MILL POND
--------------	-----------

⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖
RIVER BASIN	RIVER OR STREAM			NEAREST DOWNSTREAM CITY-TOWN-VILLAGE			DIST FROM DAM (MI.)	POPULATION				
REGON BASIN				SPRINGFIELD			0	168785				

②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭
TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURE TYPE	HYPDULIC HEAD	IMPOUNDING CAPACITIES	MAXIMUM	REGULATORY	OWNER	DIST	FED R	PRV/FED	SCS & VER/DATE
GRPG	1892	R	46	13	MAXIMUM CAPACITY (ACRE-FT.)	ACRE-FT.	ACRE-FT.	N	N	N	N	40EC78
				16	86			N	N	N	N	

⑭	⑮	⑯	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖
REMARKS												

②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭
OS SPILLWAY HAS CREST, TYPE NORTH	MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CF)	POWER CAPACITY INSTALLED (KWH)	PROPOSED (KWH)	NO. TURBINES	LEAD TURBINE	LEAD TURBINE	NO. TURBINES	LEAD TURBINE	LEAD TURBINE	NO. TURBINES	NAVIGATION LOCKS
3 46 N	46	670										

②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
OWNER	CONSTRUCTION	ENGINEERING BY	CONSTRUCTION BY								
CITY OF SPRINGFIELD											

②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
DESIGN	CONSTRUCTION	REGULATORY AGENCY	OPERATION	MAINTENANCE							
NONE	NONE		NONE	NONE							

②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
INSPECTION BY	INSPECTION DATE	AUTHORITY FOR INSPECTION									
CAMP DRESSER + MCKEE INC	07SEP78	PL 92-367									

②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	
REMARKS												

END

FILMED

8-85

DTIC